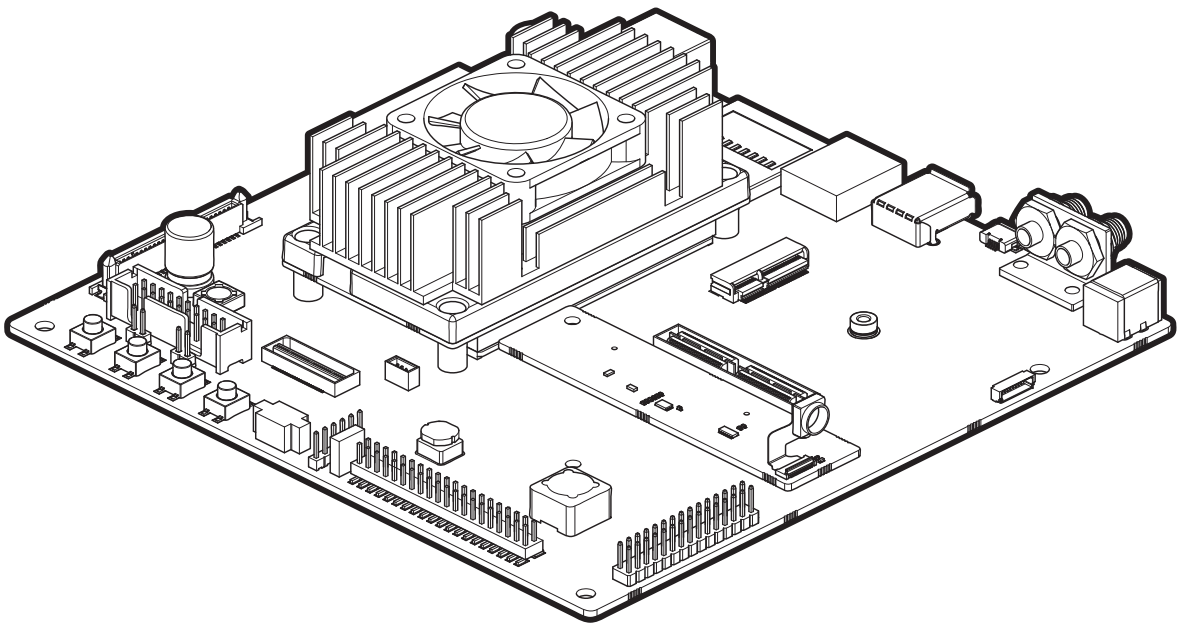
NVIDIA® JETSON TX1
DEVELOPER KIT

QUICK START GUIDE



NVIDIA

INTRODUCTION

The NVIDIA® Jetson TX1 Developer Kit is a full-featured development platform for visual computing. It is ideal for applications requiring high computational performance in a low power envelope. The Jetson TX1 Developer kit is designed to get you up and running quickly by shipping pre-flashed with a Linux environment. It includes support for many common APIs and is supported by the complete NVIDIA development tool chain. The board exposes many standard hardware interfaces, enabling a highly flexible and extensible platform.

Go to **http://developer.nvidia.com/embedded-computing** for access to software updates and the developer SDK supporting the OS image and host development platform that you want to use. The SDK includes an OS image that you will load onto your device, developer tools, supporting documentation, and code samples to help you get started.

GETTING STARTED

Individual development efforts will vary and may result in modifications to the system configuration. It is recommended that you begin with the basic system configuration (as shipped) to ensure proper system operation prior to any further development.

> **!** **CAUTION:** The NVIDIA® Jetson TX1 Developer Kit contains ESD-sensitive parts. Always use appropriate anti-static and grounding techniques when working with the system. Failure to do so can result in ESD discharge to sensitive pins, and irreparably damage your Jetson TX1 Developer Kit. NVIDIA will not replace units that have been damaged due to ESD discharge. Always disconnect any power source prior to adding additional modules or connecting peripheral devices to the developer board. It is important that all modules are properly seated in their connectors to ensure proper operation and to avoid damaging the module or the carrier board.

Installing the antennas

Install the antennas into the threaded connectors on the bracket shown [3]. Both included antennas are identical and can be installed on either threaded connector. Be careful not to cross thread the antenna or the antenna may not be seated all the way and will lead to poor reception.

Expansion Header Voltage Selection

Voltage level for the Expansion Header [15] is set by the Expansion Header Voltage Selection jumper [13]. For default voltage 3.3V, the jumper is installed on pins 1-2. For alternate voltage 1.8V, the jumper is installed on pins 2-3.

Powering Up

1. Connect a USB keyboard and mouse. It is recommended to connect these devices to a USB hub (not provided), with the hub connected to the USB Type A connector of your device [5].
2. Connect an HDMI-compatible display to the HDMI connector on your device [7].
3. Connect the AC adapter supplied in your kit to the power connector of your device. Use the supplied AC adapter since it is appropriately rated for your kit.
4. Plug the power adapter into an appropriately rated electrical outlet.
5. Press and release the power button on the device [19].

Login Credentials

> Username: ***nvidia***
> Password: ***nvidia***

Note: Login is not required on the serial console or graphical desktop. Please plan physical security accordingly.

Force Recovery Mode

You must be in Forced USB Recovery Mode to update your system and transfer system software to the developer board. When in Force USB Recovery Mode, you are able to update system software and write the boot loader, boot configuration table (BCT), and partition configuration.

See the Developer SDK documentation for OS-specific instructions when updating system software on your Developer Kit.

CAUTION: ALWAYS CONNECT ALL EXTERNAL PERIPHERAL DEVICES BEFORE CONNECTING THE POWER SUPPLY TO THE AC POWER JACK. Connecting a device while powered on may damage the Developer Kit or peripheral device. The board should be powered down and the power removed before plugging or unplugging devices or add-on modules into the headers. (Wait for the red power LED to turn off, or wait for 5 minutes if your system does not have a power LED.) This includes the camera and display headers, the M.2 connector, the PCIe x4 connector, SATA, and the expansion headers.

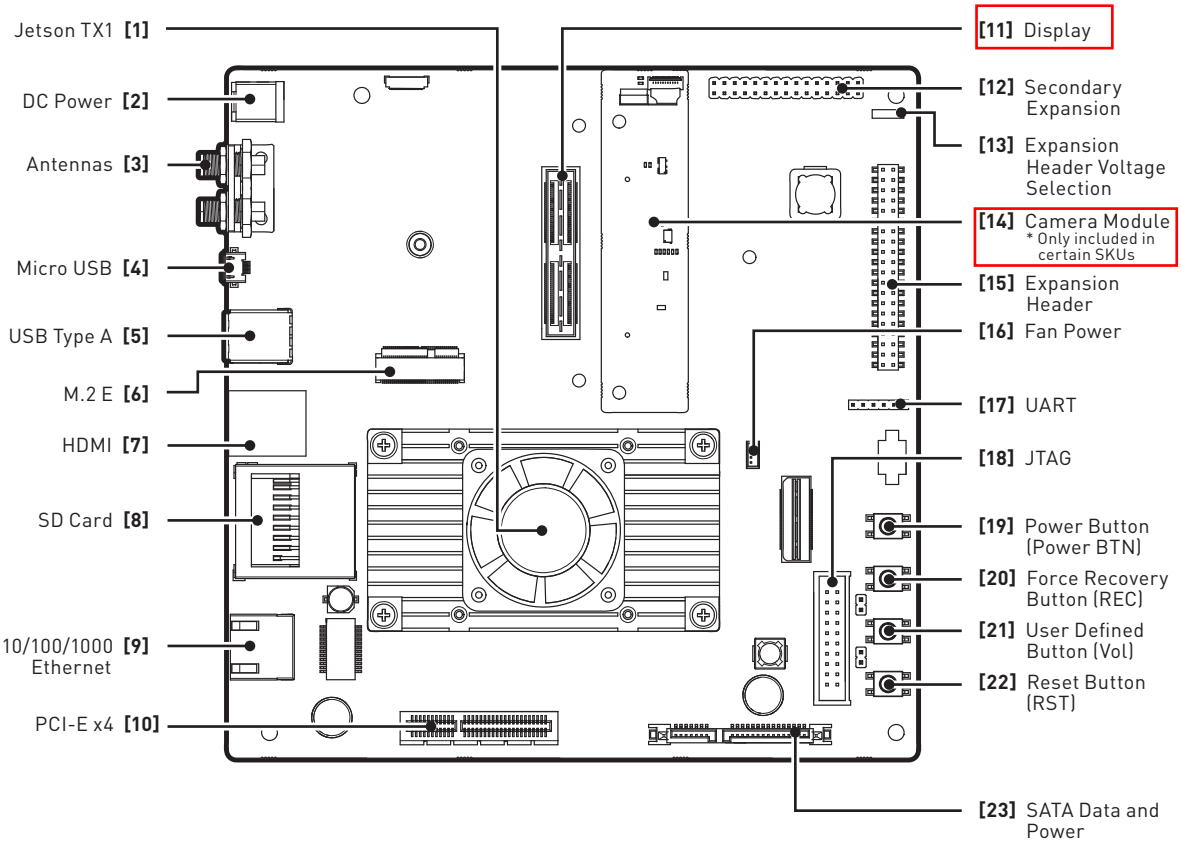
Place system in Force USB Recovery Mode:

1. Power down the device. If connected, remove the AC adapter from the device. The device MUST be powered OFF, not in a suspend or sleep state.
2. Connect the Micro-B plug on the USB cable to the Recovery (USB Micro-B) Port on the device [4] and the other end to an available USB port on the host PC.
3. Connect the power adapter to the device [2].
4. With the system powered on, press and release the POWER button [19]; press and hold the RECOVERY FORCE button [20]; while depressing the RECOVERY FORCE button, press and release the RESET button [22]; wait two seconds and release the RECOVERY FORCE button.

Note: When in Force USB Recovery Mode, the development system will not boot up (nothing appears on display or serial port).

After successfully updating the system software and restarting your Developer Kit, the system continues through the boot up process.

CONNECTION SYSTEM LAYOUT



KEY FEATURES

Jetson TX1 Module

> NVIDIA Maxwell GPU with 256 CUDA-cores
> Quad-core ARM® Cortex®-A57 MPCore Processor
> 4 GB LPDDR4 Memory
> 16GB eMMC 5.1 Flash Storage
> Connects to 802.11ac Wi-Fi and Bluetooth enabled devices
> 10/100/1000BASE-T Ethernet

Buttons

> Power On/Off
> Reset
> Force Recovery
> User-defined

Power Options

> External 19V AC adapter

I/O

> USB 3.0 Type A
> USB 2.0 Micro AB (supports recovery and host mode)
> HDMI
> M.2 Key E
> PCI-E x4
> Gigabit Ethernet
> Full-size SD
> SATA data + power
> GPIOs, I2C, I2S, SPI*
> TTL UART with flow control
> Display expansion header*
> Camera expansion header*

* I/O Expansion headers: refer to product documentation for header specification.

KIT CONTENTS

> NVIDIA Jetson TX1 Developer Kit carrier board
> AC adapter
> Power Cord
> Rubber feet (4)
> Quick Start Guide
> Safety Booklet
> Antennas to connect to Wi-Fi enabled devices (2)

The following items are recommended, but not included:

> HDMI display and cable (type A)
> Keyboard and Mouse
> JTAG debugger
> TTL to RS232 UART

ADDITIONAL INFORMATION

Recommended Operating Conditions

Ambient Operating Temperature: Min: 0 °C, Max: 50 °C

Following items only included in certain SKUs:

> Jetson Camera Module
> USB Micro-B to USB A cable
> USB Micro-B to Female USB A cable

OBTAINING SUPPORT

http://developer.nvidia.com/embedded-computing

EN
The Jetson TX1 Developer Kit is supported via the NVIDIA Embedded Developer Zone. Please visit: **http://developer.nvidia.com/embedded-computing**

FR
Le support pour le Kit de développement Jetson TX1 est disponible via le portail Jetson. Rendez-vous sur: **http://developer.nvidia.com/embedded-computing**

IT
Il Jetson TX1 Developer Kit è supportato per mezzo del NVIDIA Embedded Developer Zone. Visitare **http://developer.nvidia.com/embedded-computing**

DE
Das Jetson TX1 Developer Kit wird über das Jetson-Portal unterstützt. Gehen Sie bitte auf **http://developer.nvidia.com/embedded-computing**

ES
El soporte para el kit de desarrollo Jetson TX1 se proporciona a través del portal de Jetson. Por favor, entra en **http://developer.nvidia.com/embedded-computing**

RU
Техническая поддержка набора для разработчиков Jetson TX1 осуществляется на портале Jetson. Более подробная информация доступна на **http://developer.nvidia.com/embedded-computing**

PL
Wsparcie dla zestawu dla programistów Jetson TX1 dostępne jest poprzez witrynę NVIDIA Embedded Developer Zone. Prosimy o odwiedzenie: **http://developer.nvidia.com/embedded-computing**

HE
ניתן לקבל תמיכה לערכת הפיתוח Jetson TX1 בפורטל של Jetson, בכתובת:
http://developer.nvidia.com/embedded-computing

JP
Jetson TX1 開発キットはJetsonポータル経由でサポートされます。詳細はこちら **http://developer.nvidia.com/embedded-computing**

ZH-CN (中文简体)
Jetson TX1 开发者套件的支持信息尽在 NVIDIA Embedded Developer Zone。请访问**http://developer.nvidia.com/embedded-computing**

ZH-TW (中文繁體)
Jetson TX1 開發工具包可以從 Jetson 工具平台入口下載。詳情請參訪 **http://developer.nvidia.com/embedded-computing**

KR
Jetson TX1 개발자 키트에 대한 자세한 사항은 Jetson 포털을 통해 지원되고 있습니다. 이곳을 방문해주세요.
http://developer.nvidia.com/embedded-computing

LEGAL INFORMATION

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

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